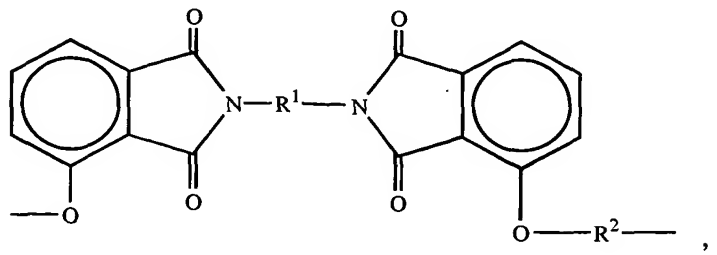
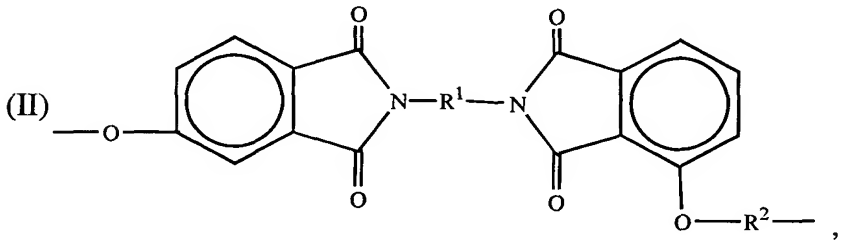
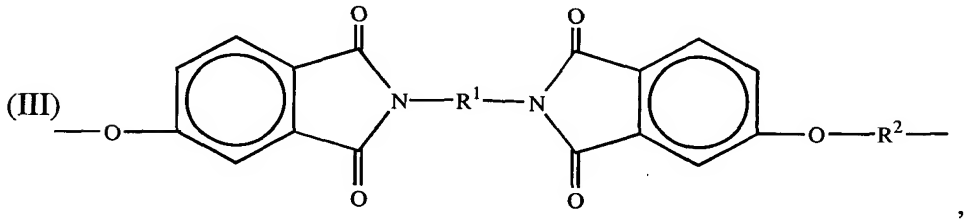
CLAIMS:

[c01] 1. A copolyetherimide having a glass transition temperature of at least about 218°C, said copolyetherimide comprising structural units of the formulas (I) and (II):

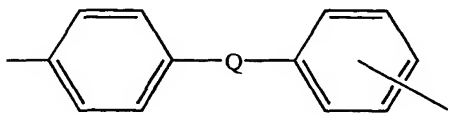
(I) 

(II) 

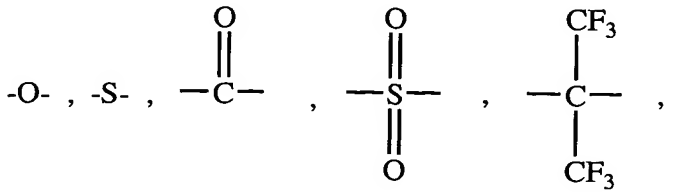
and optionally structural units of the formula (III):

(III) 

wherein R^1 comprises an unsubstituted C_{6-22} divalent aromatic hydrocarbon or a substituted C_{6-22} divalent aromatic hydrocarbon comprising halogen or alkyl substituents or mixtures of said substituents; or a divalent radical of the general formula (IV):

(IV) 

group wherein the unassigned positional isomer about the aromatic ring is either meta or para to Q, and Q is a covalent bond or a member selected from the consisting of formulas (V):

(V) 

and an alkylene or alkylidene group of the formula C_yH_{2y}, wherein y is an integer from 1 to 5 inclusive, and R^2 is a divalent aromatic radical; the weight ratio of units of formula (I) to those of formula (II) being in the range of about 99.9:0.1 and about 25:75.

[c02] 2. The copolyetherimide according to claim 1 having a Tg greater than about 218°C.

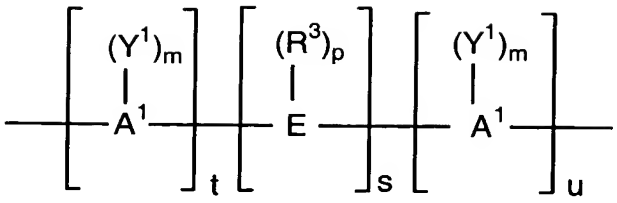
[c03] 3. The copolyetherimide according to claim 1 comprising structural units of the formula (III).

[c04] 4. The copolyetherimide according to claim 1 wherein R^1 is derived from at least one diamine selected from the group consisting of meta-phenylenediamine; para-phenylenediamine; 2-methyl-4,6-diethyl-1,3-phenylenediamine; 5-methyl-4,6-diethyl-1,3-phenylenediamine; bis(4-aminophenyl)-2,2-propane; bis(2-chloro-4-amino-3,5-diethylphenyl)methane, 4,4'-diaminodiphenyl, 3,4'-diaminodiphenyl, 4,4'-diaminodiphenyl ether, 3,4'-diaminodiphenyl ether, 4,4'-diaminodiphenyl sulfone, 3,4'-diaminodiphenyl sulfone, 4,4'-diaminodiphenyl ketone, 3,4'-diaminodiphenyl ketone, 2,4-toluenediamine; and mixtures thereof.

[c05] 5. The copolyetherimide according to claim 1 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon of the formula (VI):

(VI) HO---D---OH

wherein D has the structure of formula (VII):

(VII) 

wherein A^1 represents an aromatic group;

E comprises a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, phosphonyl; an ether linkage; a carbonyl group; a tertiary nitrogen group; a silicon-containing linkage; silane; siloxy; a cycloaliphatic group; cyclopentylidene, 3,3,5-trimethylcyclopentylidene, cyclohexylidene, 3,3-dimethylcyclohexylidene, 3,3,5-trimethylcyclohexylidene, methylcyclohexylidene, 2-[2.2.1]-bicycloheptylidene, neopentylidene, cyclopentadecylidene, cyclododecylidene, adamantylidene; an alkylene or alkylidene group, which group may optionally be part of one or more fused rings attached to one or more aromatic groups bearing one hydroxy substituent; an unsaturated alkylidene group; or two or more alkylene or alkylidene groups connected by a moiety different from alkylene or alkylidene and selected from the group consisting of an aromatic linkage, a tertiary nitrogen linkage; an ether linkage; a carbonyl linkage; a silicon-containing linkage, silane, siloxy; a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, and phosphonyl;

R^3 comprises hydrogen; a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, or cycloalkyl;

Y^1 independently at each occurrence is selected from the group consisting of an inorganic atom, a halogen; an inorganic group, a nitro group; an organic group, a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, and an alkoxy group;

the letter "m" represents any integer from and including zero through the number of positions on A^1 available for substitution;

the letter "p" represents an integer from and including zero through the number of positions on E available for substitution;

the letter "t" represents an integer equal to at least one;

the letter "s" represents an integer equal to either zero or one; and

"u" represents any integer including zero.

[c06] 6. The copolyetherimide of claim 5 wherein R^2 structural units in each of formulas (I), (II) and (III) are the same.

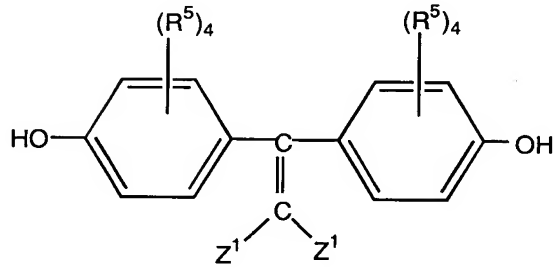
[c07] 7. The copolyetherimide of claim 5 wherein at least a portion of R^2 structural units in at least two of formulas (I), (II) and (III) are not the same.

[c08] 8. The copolyetherimide according to claim 1 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of 4,4'-(cyclopentylidene)diphenol; 4,4'-(3,3,5-trimethylcyclopentylidene)diphenol; 4,4'-(cyclohexylidene)diphenol; 4,4'-(3,3-dimethylcyclohexylidene)diphenol; 4,4'-(3,3,5-trimethylcyclohexylidene)diphenol; 4,4'-(methylcyclohexylidene)diphenol; 4,4'-bis(3,5-dimethyl)diphenol, 1,1-bis(4-hydroxy-3-methylphenyl)cyclohexane; 4,4-bis(4-hydroxyphenyl)heptane; 2,4´-dihydroxydiphenylmethane; bis(2-hydroxyphenyl)methane; bis(4-hydroxyphenyl)methane; bis(4-hydroxy-5-nitrophenyl)methane; bis(4-hydroxy-2,6-dimethyl-3-methoxyphenyl)methane; 1,1-bis(4-hydroxyphenyl)ethane; 1,2-bis(4-hydroxyphenyl)ethane; 1,1-bis(4-hydroxy-2-chlorophenyl)ethane; 2,2-bis(4-hydroxyphenyl)propane; 2,2-bis(3-phenyl-4-hydroxyphenyl)propane; 2,2-bis(4-hydroxy-3-methylphenyl)propane; 2,2-bis(4-hydroxy-3-ethylphenyl)propane; 2,2-bis(4-hydroxy-3-isopropylphenyl)propane; 2,2-bis(4-hydroxy-3,5-dimethylphenyl)propane; 3,5,3',5'-tetrachloro-4,4'-dihydroxyphenyl)propane; bis(4-hydroxyphenyl)cyclohexylmethane; 2,2-bis(4-hydroxyphenyl)-1-phenylpropane; 2,4'-dihydroxyphenyl sulfone; dihydroxy naphthalene, 2,6-dihydroxy naphthalene; hydroquinone; resorcinol; C_{1-3} alkyl-substituted resorcinols; 2,2-bis-(4-hydroxyphenyl)butane; 2,2-bis-(4-hydroxyphenyl)-2-methylbutane; 1,1-bis-(4-hydroxyphenyl)cyclohexane; bis-(4-hydroxyphenyl); bis-(4-hydroxyphenyl)sulphide; 2-(3-methyl-4-hydroxyphenyl-2-(4-hydroxyphenyl)propane; 2-(3,5-dimethyl-4-hydroxyphenyl)-2-(4-hydroxyphenyl)propane; 2-(3-methyl-4-hydroxyphenyl)-2-(3,5-dimethyl-4-hydroxyphenyl)propane; bis-(3,5-dimethylphenyl-4-

hydroxyphenyl)methane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)ethane; 2,2-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)propane; 2,4-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)-2-methylbutane; 3,3-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)pentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclopentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclohexane; bis-(3,5-dimethylphenyl-4-hydroxyphenyl)sulphide, 3-(4-hydroxyphenyl)-1,1,3-trimethylindan-5-ol, 1-(4-hydroxyphenyl)-1,3,3-trimethylindan-5-ol, 2,2,2',2'-tetrahydro-3,3,3',3'-tetramethyl-1,1'-spirobi[1H-indene]-6,6'-diol, and mixtures thereof.

[c09] 9. The copolyetherimide according to claim 1 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of those of the formula (IX):

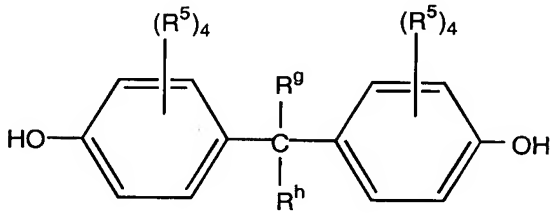
(IX)



,

where independently each R^5 is hydrogen, chlorine, bromine or a C_{1-30} monovalent hydrocarbon or hydrocarbonoxy group, each Z^1 is hydrogen, chlorine or bromine, subject to the provision that at least one Z^1 is chlorine or bromine; and those of the formula (X):

(X)



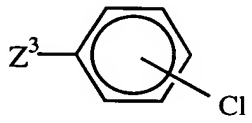
,

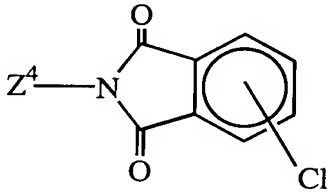
where independently each R^5 is as defined hereinbefore, and independently R^g and R^h are hydrogen or a C_{1-30} hydrocarbon group.

[c10] 10. The copolyetherimide according to claim 9 wherein R^2 is derived from bisphenol A.

[c11] 11. The copolyetherimide according to claim 1 further comprising structural units derived from at least one chain termination agent.

[c12] 12. The copolyetherimide according to claim 11 wherein the chain termination agent is at least one unsubstituted or substituted member selected from the group consisting of alkyl halides, alkyl chlorides, aryl halides, aryl chlorides, and chlorides of formulas (XVII) and (XVIII):

(XVII) 

(XVIII) 

wherein the chlorine substituent is in the 3- or 4-position, and Z^3 and Z^4 comprise a substituted or unsubstituted alkyl or aryl group.

[c13] 13. The copolyetherimide according to claim 11 wherein the chain termination agent is at least one member selected from the group consisting of monochlorobenzophenone, monochlorodiphenylsulfone; a monochlorophthalimide; 4-chloro-N-methylphthalimide, 4-chloro-N-butylphthalimide, 4-chloro-N-octadecylphthalimide, 3-chloro-N-methylphthalimide, 3-chloro-N-butylphthalimide, 3-chloro-N-octadecylphthalimide, 4-chloro-N-phenylphthalimide, 3-chloro-N-phenylphthalimide; a mono-substituted bis-phthalimide; a monochlorobisphthalimidobenzene; 1-[N-(4-chlorophthalimido)]-3-(N-phthalimido)benzene; 1-[N-(3-chlorophthalimido)]-3-(N-phthalimido)benzene; monochlorobisphthalimidodiphenyl sulfone, monochlorobisphthalimidodiphenyl ketone, a monochlorobisphthalimidophenyl ether; 4-[N-(4-chlorophthalimido)]phenyl-4'-(N-phthalimido)phenyl ether; 4-[N-(3-chlorophthalimido)phenyl]-4'-(N-phthalimido)phenyl ether, and the corresponding isomers of the latter two compounds derived from 3,4'-diaminodiphenyl ether.

[c14] 14. The copolyetherimide according to claim 1 wherein the weight ratio of units of formula I to those of formula II is in the range of between about 99:1 and about 25:75.

[c15] 15. The copolyetherimide according to claim 1 which has a heat distortion temperature at 0.455 mPa of at least 205°C.

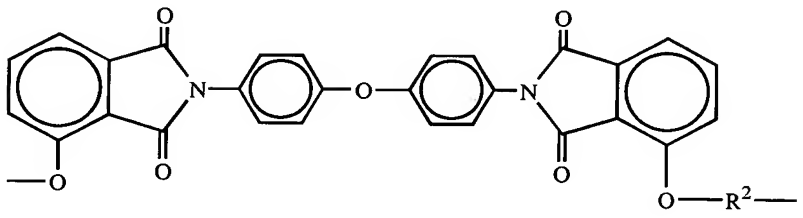
[c16] 16. The copolyetherimide according to claim 1 which has a heat distortion temperature at 0.455 mPa of at least 210°C.

[c17] 17. The copolyetherimide according to claim 1 which has a temperature of transition between the brittle and ductile states of at most 30°C as measured by ASTM method D3763.

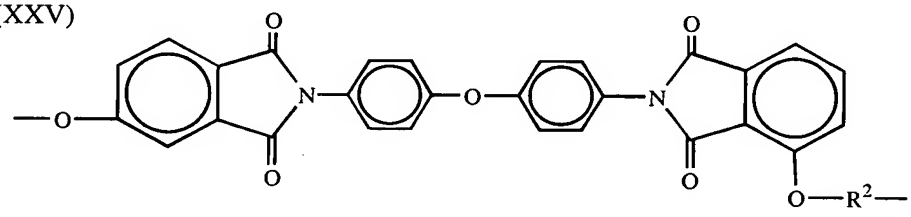
[c18] 18. The copolyetherimide according to claim 1 which has a weight average molecular weight, as determined by gel permeation chromatography relative to polystyrene standards, in the range of between about 30,000 and about 80,000.

[c19] 19. A copolyetherimide having a glass transition temperature of at least 218°C, said copolyetherimide comprising structural units of the formulas (XXIV) and (XXV) :

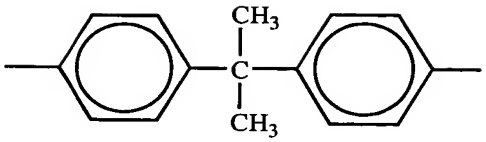
(XXIV)



(XXV)



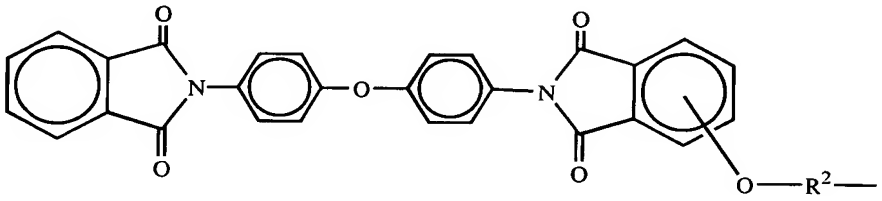
wherein R^2 is



the weight ratio of units of formula (XXIV) to those of formula (XXV) being in the range of between about 99:1 and about 25:75.

[c20] 20. The copolyetherimide of claim 19 further comprising structural units selected from the group consisting of those of the formula (XXVI):

(XXVI)

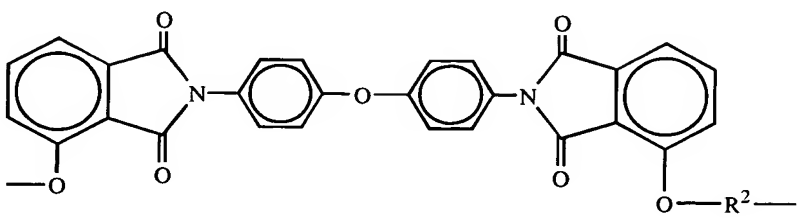


wherein the unassigned positional isomer about the phthalimide ring is either in the 3-position or 4-position, and mixtures thereof.

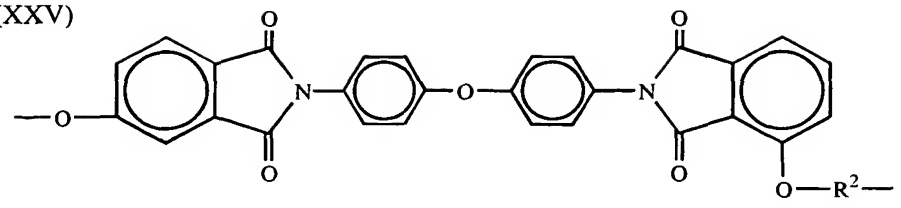
[c21] 21. The copolyetherimide of claim 19 having a viscosity value less than or approximately equal to the viscosity of a polyetherimide of comparable molecular weight derived from bisphenol A disodium salt and a 4:96 ratio of m-bis(3-chloro-N-phthalimido)benzene and m-bis(4-chloro-N-phthalimido)benzene, said viscosity determined at 380°C and 1000 s^{-1}.

[c22] 22. A copolyetherimide having a glass transition temperature of at least 218°C, said copolyetherimide comprising structural units of the formulas (XXIV), (XXV) and (XXVII) :

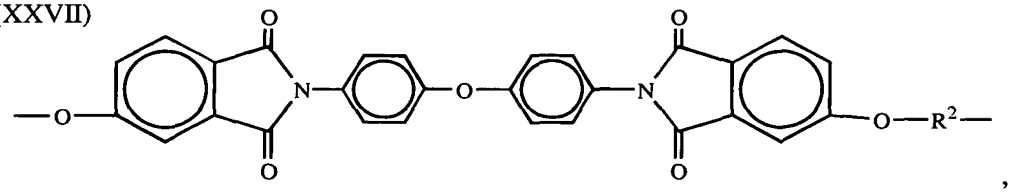
(XXIV)



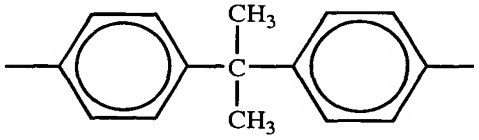
(XXV)



(XXVII)



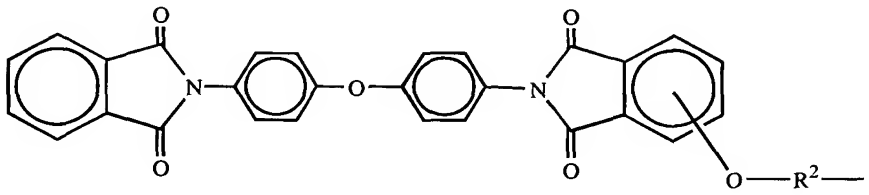
wherein R^2 is



the weight ratio of units of formula (XXIV) to those of formula (XXV) being in the range of between about 99:1 and about 25:75.

[c23] 23. The copolyetherimide of claim 22 further comprising structural units selected from the group consisting of those of the formula (XXVI):

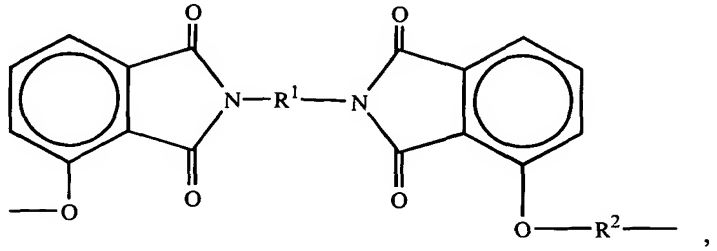
(XXVI)

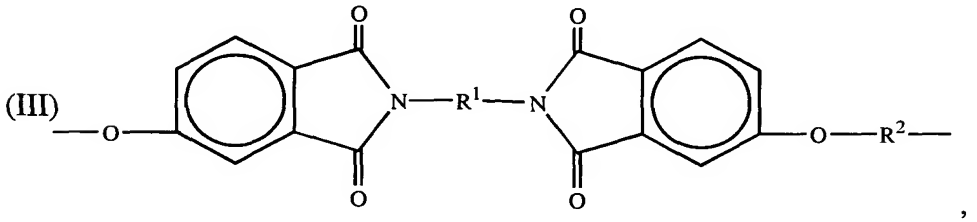


wherein the unassigned positional isomer about the phthalimide ring is either in the 3-position or 4-position, and mixtures thereof.

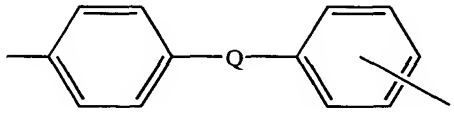
[c24] 24. The copolyetherimide of claim 22 having a viscosity value less than or approximately equal to the viscosity of a polyetherimide of comparable molecular weight derived from bisphenol A disodium salt and a 4:96 ratio of m-bis(3-chloro-N-phthalimido)benzene and m-bis(4-chloro-N-phthalimido)benzene, said viscosity determined at 380°C and 1000 s^{-1}.

[c25] 25. A copolyetherimide having a glass transition temperature of at least 218°C, said copolyetherimide comprising structural units of the formulas (I) and (III):

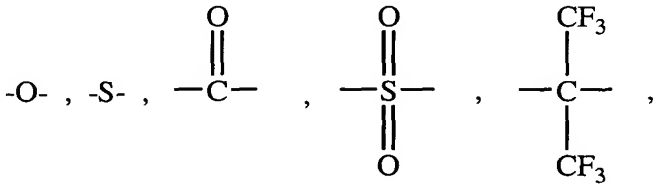
(I) 

(III) 

wherein R^1 comprises an unsubstituted C_{6-22} divalent aromatic hydrocarbon or a substituted C_{6-22} divalent aromatic hydrocarbon comprising halogen or alkyl substituents or mixtures of said substituents; or a divalent radical of the general formula (IV):

(IV) 

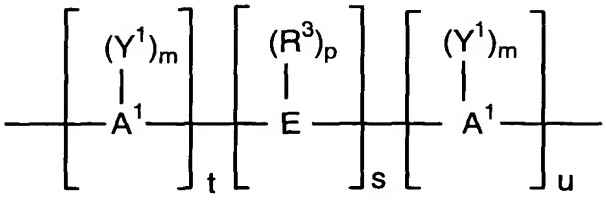
wherein the unassigned positional isomer about the aromatic ring is either meta or para to Q, and Q is a covalent bond or a member selected from the group consisting of formulas (V):

(V) 

and an alkylene or alkylidene group of the formula C_yH_{2y}, wherein y is an integer from 1 to 5 inclusive, and R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon of the formula (VI):

(VI) HO---D---OH

wherein D has the structure of formula (VII):

(VII) 

wherein A^1 represents an aromatic group;

E comprises a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, phosphonyl; an ether linkage; a carbonyl group; a tertiary nitrogen group; a silicon-containing linkage; silane; siloxy; a cycloaliphatic group; cyclopentylidene, 3,3,5-trimethylcyclopentylidene, cyclohexylidene, 3,3-dimethylcyclohexylidene, 3,3,5-trimethylcyclohexylidene, methylcyclohexylidene, 2-[2.2.1]-bicycloheptylidene, neopentylidene, cyclopentadecylidene, cyclododecylidene, adamantylidene; an alkylene or alkylidene group, which group may optionally be part of one or more fused rings attached to one or more aromatic groups bearing one hydroxy substituent; an unsaturated alkylidene group; or two or more alkylene or alkylidene groups connected by a moiety different from alkylene or alkylidene and selected from the group consisting of an aromatic linkage, a tertiary nitrogen linkage; an ether linkage; a carbonyl linkage; a silicon-containing linkage, silane, siloxy; a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, and phosphonyl;

R^3 represents hydrogen; a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, or cycloalkyl;

Y^1 independently at each occurrence is selected from the group consisting of an inorganic atom, a halogen; an inorganic group, a nitro group; an organic group, a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, and an alkoxy group;

the letter "m" represents any integer from and including zero through the number of positions on A^1 available for substitution;

the letter "p" represents an integer from and including zero through the number of positions on E available for substitution;

the letter "t" represents an integer equal to at least one;

the letter "s" represents an integer equal to either zero or one; and

the letter "u" represents an integer equal to at least one,

and wherein the weight ratio of units of formula I to those of formula III is in the range of between about 99.9:0.1 and about 10:90.

[c26] 26. The copolyetherimide according to claim 25 having a Tg greater than about 218°C.

[c27] 27. The copolyetherimide according to claim 25 wherein R^1 is derived from at least one diamine selected from the group consisting of meta-phenylenediamine; para-phenylenediamine; 2-methyl-4,6-diethyl-1,3-phenylene-diamine; 5-methyl-4,6-diethyl-1,3-phenylenediamine; bis(4-aminophenyl)-2,2-propane; bis(2-chloro-4-amino-3,5-diethylphenyl)methane, 4,4'-diaminodiphenyl, 3,4'-diaminodiphenyl, 4,4'-diaminodiphenyl ether, 3,4'-diaminodiphenyl ether, 4,4'-diaminodiphenyl sulfone, 3,4'-diaminodiphenyl sulfone, 4,4'-diaminodiphenyl ketone, 3,4'-diaminodiphenyl ketone, 2,4-toluenediamine; and mixtures thereof.

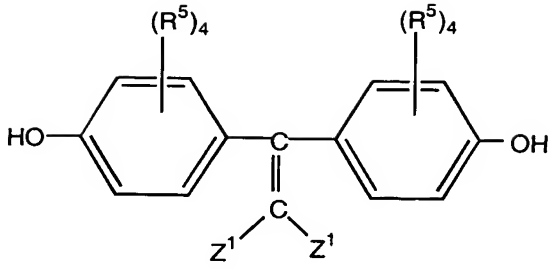
[c28] 28. The copolyetherimide of claim 25 wherein R^2 structural units in each of formulas (I) and (III) is the same.

[c29] 29. The copolyetherimide of claim 25 wherein at least a portion of R^2 structural units in formulas (I) and (III) is not the same.

[c30] 30. The copolyetherimide according to claim 25 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of 4,4'-(cyclopentylidene)diphenol; 4,4'-(3,3,5-trimethylcyclopentylidene)diphenol; 4,4'-(cyclohexylidene)diphenol; 4,4'-(3,3-

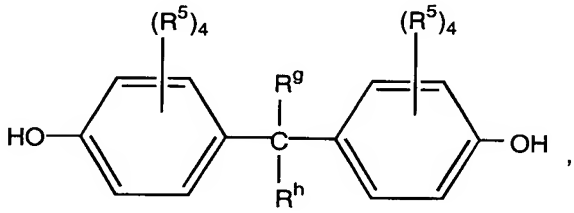
dimethylcyclohexylidene)diphenol; 4,4'-(3,3,5-trimethylcyclohexylidene)diphenol; 4,4'-(methylcyclohexylidene)diphenol; 4,4'-bis(3,5-dimethyl)diphenol, 1,1-bis(4-hydroxy-3-methylphenyl)cyclohexane; 4,4-bis(4-hydroxyphenyl)heptane; 2,4´-dihydroxydiphenylmethane; bis(2-hydroxyphenyl)methane; bis(4-hydroxyphenyl)methane; bis(4-hydroxy-5-nitrophenyl)methane; bis(4-hydroxy-2,6-dimethyl-3-methoxyphenyl)methane; 1,1-bis(4-hydroxyphenyl)ethane; 1,2-bis(4-hydroxyphenyl)ethane; 1,1-bis(4-hydroxy-2-chlorophenyl)ethane; 2,2-bis(4-hydroxyphenyl)propane; 2,2-bis(3-phenyl-4-hydroxyphenyl)propane; 2,2-bis(4-hydroxy-3-methylphenyl)propane; 2,2-bis(4-hydroxy-3-ethylphenyl)propane; 2,2-bis(4-hydroxy-3-isopropylphenyl)propane; 2,2-bis(4-hydroxy-3,5-dimethylphenyl)propane; 3,5,3',5'-tetrachloro-4,4'-dihydroxyphenyl)propane; bis(4-hydroxyphenyl)cyclohexylmethane; 2,2-bis(4-hydroxyphenyl)-1-phenylpropane; 2,4'-dihydroxyphenyl sulfone; 2,2-bis-(4-hydroxyphenyl)butane; 2,2-bis-(4-hydroxyphenyl)-2-methylbutane; 1,1-bis-(4-hydroxyphenyl)cyclohexane; bis-(4-hydroxyphenyl); bis-(4-hydroxyphenyl)sulphide; 2-(3-methyl-4-hydroxyphenyl-2-(4-hydroxyphenyl)propane; 2-(3,5-dimethyl-4-hydroxyphenyl)-2-(4-hydroxyphenyl)propane; 2-(3-methyl-4-hydroxyphenyl)-2-(3,5-dimethyl-4-hydroxyphenyl)propane; bis-(3,5-dimethylphenyl-4-hydroxyphenyl)methane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)ethane; 2,2-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)propane; 2,4-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)-2-methylbutane; 3,3-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)pentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclopentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclohexane; bis-(3,5-dimethylphenyl-4-hydroxyphenyl)sulphide, 3-(4-hydroxyphenyl)-1,1,3-trimethylindan-5-ol, 1-(4-hydroxyphenyl)-1,3,3-trimethylindan-5-ol, 2,2,2',2'-tetrahydro-3,3,3',3'-tetramethyl-1,1'-spirobi[1H-indene]-6,6'-diol, and mixtures thereof.

[c31] 31. The copolyetherimide according to claim 25 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of those of the formula (IX):

(IX) 

,

where independently each R^5 is hydrogen, chlorine, bromine or a C_{1-30} monovalent hydrocarbon or hydrocarbonoxy group, each Z^1 is hydrogen, chlorine or bromine, subject to the provision that at least one Z^1 is chlorine or bromine; and those of the formula (X):

(X) 

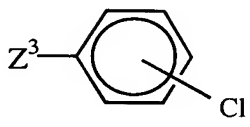
,

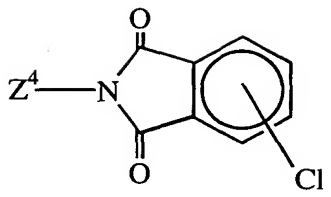
where independently each R^5 is as defined hereinbefore, and independently R_g and R_h are hydrogen or a C_{1-30} hydrocarbon group.

[c32] 32. The copolyetherimide according to claim 31 wherein R^2 is derived from bisphenol A.

[c33] 33. The copolyetherimide according to claim 25 further comprising structural units derived from at least one chain termination agent.

[c34] 34. The copolyetherimide according to claim 33 wherein the chain termination agent is at least one unsubstituted or substituted member selected from the group consisting of alkyl halides, alkyl chlorides, aryl halides, aryl chlorides, and chlorides of formulas (XVII) and (XVIII):

(XVII) 

(XVIII) 

wherein the chlorine substituent is in the 3- or 4-position, and Z^3 and Z^4 comprise a substituted or unsubstituted alkyl or aryl group.

[c35] 35. The copolyetherimide according to claim 33 wherein the chain termination agent is at least one member selected from the group consisting of monochlorobenzophenone, monochlorodiphenylsulfone; a monochlorophthalimide; 4-chloro-N-methylphthalimide, 4-chloro-N-butylphthalimide, 4-chloro-N-octadecylphthalimide, 3-chloro-N-methylphthalimide, 3-chloro-N-butylphthalimide, 3-chloro-N-octadecylphthalimide, 4-chloro-N-phenylphthalimide, 3-chloro-N-phenylphthalimide; a mono-substituted bis-phthalimide; a monochlorobisphthalimidobenzene; 1-[N-(4-chlorophthalimido)]-3-(N-phthalimido)benzene; 1-[N-(3-chlorophthalimido)]-3-(N-phthalimido)benzene; monochlorobisphthalimidodiphenyl sulfone, monochlorobisphthalimidodiphenyl ketone, a monochlorobisphthalimidophenyl ether; 4-[N-(4-chlorophthalimido)]phenyl-4'-(N-phthalimido)phenyl ether; 4-[N-(3-chlorophthalimido)phenyl]-4'-(N-phthalimido)phenyl ether, and the corresponding isomers of the latter two compounds derived from 3,4'-diaminodiphenyl ether.

[c36] 36. The copolyetherimide according to claim 25 wherein the weight ratio of units of formula I to those of formula II is in the range of between about 99:1 and about 20:80.

[c37] 37. The copolyetherimide according to claim 25 which has a heat distortion temperature at 0.455 mPa of at least 205°C.

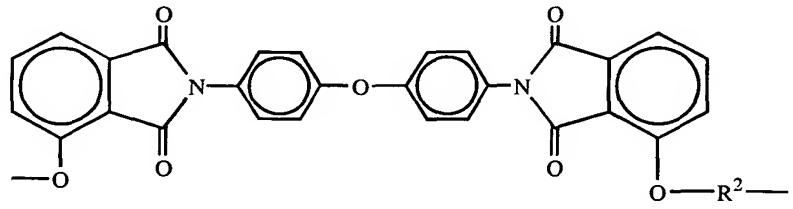
[c38] 38. The copolyetherimide according to claim 25 which has a heat distortion temperature at 0.455 mPa of at least 210°C.

[c39] 39. The copolyetherimide according to claim 25 which has a temperature of transition between the brittle and ductile states of at most 30°C as measured by ASTM method D3763.

[c40] 40. The copolyetherimide according to claim 25 which has a weight average molecular weight, as determined by gel permeation chromatography relative to polystyrene standards, in the range of between about 30,000 and about 80,000.

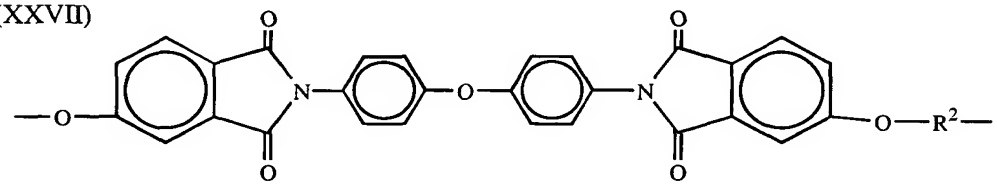
[c41] 41. A copolyetherimide having a glass transition temperature of at least 218°C, said copolyetherimide comprising structural units of the formulas (XXIV) and (XXVII):

(XXIV)

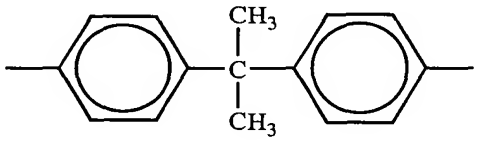


,

(XXVII)



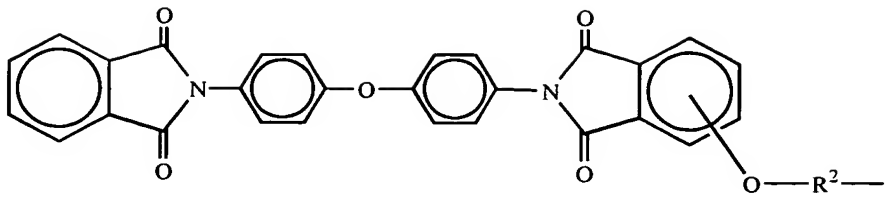
wherein R^2 is



,

the weight ratio of units of formula (XXIV) to those of formula (XXVII) being in the range of between about 99:1 and about 25:75.

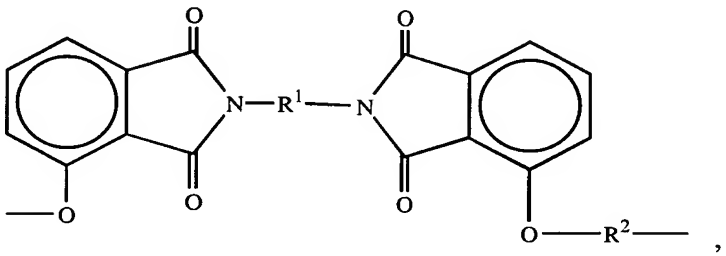
[c42] 42. The copolyetherimide of claim 41 further comprising structural units selected from the group consisting of those of the formula (XXVI):

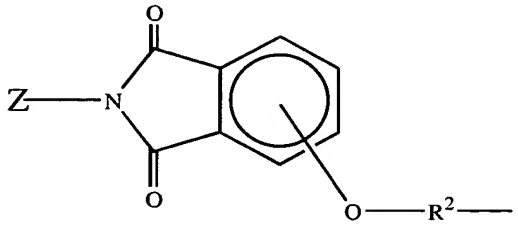
(XXVI) 

wherein the unassigned positional isomer about the phthalimide ring is either in the 3-position or 4-position, and mixtures thereof.

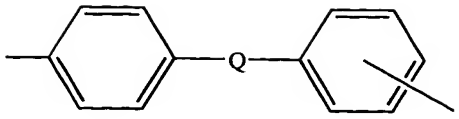
[c43] 43. The copolyetherimide of claim 41 having a viscosity value less than or approximately equal to the viscosity of a polyetherimide of comparable molecular weight derived from bisphenol A disodium salt and a 4:96 ratio of m-bis(3-chloro-N-phthalimido)benzene and m-bis(4-chloro-N-phthalimido)benzene, said viscosity determined at 380°C and 1000 s^{-1}.

[c44] 44. A copolyetherimide having a glass transition temperature of at least about 218°C, said copolyetherimide comprising structural units of the formulas (I) and (VIII):

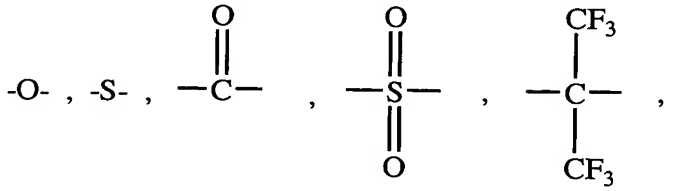
(I) 

(VIII) 

wherein R^1 comprises an unsubstituted C_{6-22} divalent aromatic hydrocarbon or a substituted C_{6-22} divalent aromatic hydrocarbon comprising halogen or alkyl substituents or mixtures of said substituents; or a divalent radical of the general formula (IV):

(IV) 

wherein the unassigned positional isomer about the aromatic ring is either meta or para to Q, and Q is a covalent bond or a member selected from the group consisting of formulas (V):

(V) 

and an alkylene or alkylidene group of the formula C_yH_{2y}, wherein y is an integer from 1 to 5 inclusive, and R^2 is a divalent aromatic radical; wherein formula (VIII) is a terminal group with Z selected from the group consisting of unsubstituted and substituted alkyl, and unsubstituted and substituted aryl, and wherein the copolyetherimide has a weight average molecular weight, as determined by gel permeation chromatography relative to polystyrene standards, in the range of between about 30,000 and about 80,000, with a polydispersity in a range of between about 2.3 and about 3.

[c45] 45. The copolyetherimide according to claim 44 having a Tg greater than about 218°C.

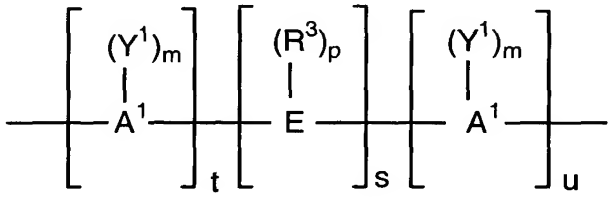
[c46] 46. The copolyetherimide according to claim 44 wherein R^1 is derived from at least one diamine selected from the group consisting of meta-phenylenediamine; para-phenylenediamine; 2-methyl-4,6-diethyl-1,3-phenylene-diamine; 5-methyl-4,6-diethyl-1,3-phenylenediamine; bis(4-aminophenyl)-2,2-propane; bis(2-chloro-4-amino-3,5-diethylphenyl)methane, 4,4'-diaminodiphenyl, 3,4'-diaminodiphenyl, 4,4'-diaminodiphenyl ether, 3,4'-diaminodiphenyl ether, 4,4'-diaminodiphenyl sulfone, 3,4'-diaminodiphenyl sulfone, 4,4'-diaminodiphenyl ketone, 3,4'-diaminodiphenyl ketone, 2,4-toluenediamine; and mixtures thereof.

[c47] 47. The copolyetherimide according to claim 44 wherein structural units of formula (VIII) are derived from at least one member selected from the group consisting of a monochlorophthalimide; 4-chloro-N-methylphthalimide, 4-chloro-N-butylphthalimide, 4-chloro-N-octadecylphthalimide, 3-chloro-N-methylphthalimide, 3-chloro-N-butylphthalimide, 3-chloro-N-octadecylphthalimide, 4-chloro-N-phenylphthalimide, 3-chloro-N-phenylphthalimide; a mono-substituted bis-phthalimide; a monochlorobisphthalimidobenzene; 1-[N-(4-chlorophthalimido)]-3-(N-phthalimido)benzene; 1-[N-(3-chlorophthalimido)]-3-(N-phthalimido)benzene; monochlorobisphthalimidodiphenyl sulfone, monochlorobisphthalimidodiphenyl ketone, a monochlorobisphthalimidophenyl ether; 4-[N-(4-chlorophthalimido)]phenyl-4'-(N-phthalimido)phenyl ether; 4-[N-(3-chlorophthalimido)phenyl]-4'-(N-phthalimido)phenyl ether, and the corresponding isomers of the latter two compounds derived from 3,4'-diaminodiphenyl ether.

[c48] 48. The copolyetherimide according to claim 44 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon of the formula (VI):

(VI) HO---D---OH

wherein D has the structure of formula (VII):

(VII) 

wherein A^1 represents an aromatic group;

E comprises a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, phosphonyl; an ether linkage; a carbonyl group; a tertiary nitrogen group; a silicon-containing linkage; silane; siloxy; a cycloaliphatic group; cyclopentylidene, 3,3,5-trimethylcyclopentylidene, cyclohexylidene, 3,3-dimethylcyclohexylidene, 3,3,5-trimethylcyclohexylidene, methylcyclohexylidene, 2-[2.2.1]-bicycloheptylidene, neopentylidene, cyclopentadecylidene, cyclododecylidene, adamantylidene; an alkylene or alkylidene

group, which group may optionally be part of one or more fused rings attached to one or more aromatic groups bearing one hydroxy substituent; an unsaturated alkylidene group; or two or more alkylene or alkylidene groups connected by a moiety different from alkylene or alkylidene and selected from the group consisting of an aromatic linkage, a tertiary nitrogen linkage; an ether linkage; a carbonyl linkage; a silicon-containing linkage, silane, siloxy; a sulfur-containing linkage, sulfide, sulfoxide, sulfone; a phosphorus-containing linkage, phosphinyl, and phosphonyl;

R^3 comprises hydrogen; a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, or cycloalkyl;

Y^1 independently at each occurrence is selected from the group consisting of an inorganic atom, a halogen; an inorganic group, a nitro group; an organic group, a monovalent hydrocarbon group, alkenyl, allyl, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, and an alkoxy group;

the letter "m" represents any integer from and including zero through the number of positions on A^1 available for substitution;

the letter "p" represents an integer from and including zero through the number of positions on E available for substitution;

the letter "t" represents an integer equal to at least one;

the letter "s" represents an integer equal to either zero or one; and

"u" represents any integer including zero.

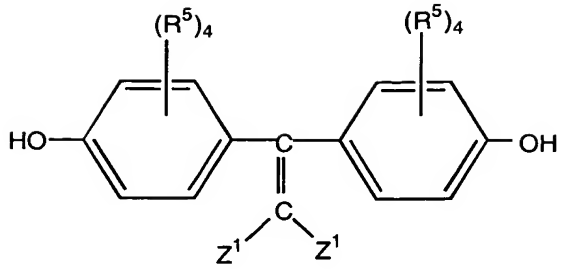
[c49] 49. The copolyetherimide of claim 48 wherein R^2 structural units in each of formulas (I) and (VIII) are the same.

[c50] 50. The copolyetherimide of claim 48 wherein at least a portion of R^2 structural units in each of formulas (I) and (VIII) are not the same.

[c51] 51. The copolyetherimide according to claim 44 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of 4,4'-(cyclopentylidene)diphenol; 4,4'-(3,3,5-

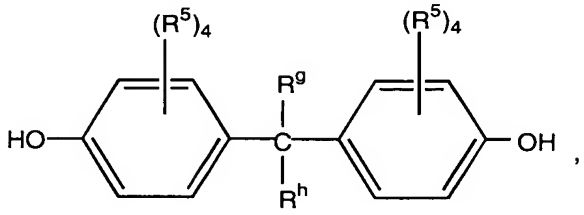
trimethylcyclopentylidene)diphenol; 4,4'-(cyclohexylidene)diphenol; 4,4'-(3,3-dimethylcyclohexylidene)diphenol; 4,4'-(3,3,5-trimethylcyclohexylidene)diphenol; 4,4'-(methylcyclohexylidene)diphenol; 4,4'-bis(3,5-dimethyl)diphenol, 1,1-bis(4-hydroxy-3-methylphenyl)cyclohexane; 4,4-bis(4-hydroxyphenyl)heptane; 2,4´-dihydroxydiphenylmethane; bis(2-hydroxyphenyl)methane; bis(4-hydroxyphenyl)methane; bis(4-hydroxy-5-nitrophenyl)methane; bis(4-hydroxy-2,6-dimethyl-3-methoxyphenyl)methane; 1,1-bis(4-hydroxyphenyl)ethane; 1,2-bis(4-hydroxyphenyl)ethane; 1,1-bis(4-hydroxy-2-chlorophenyl)ethane; 2,2-bis(4-hydroxyphenyl)propane; 2,2-bis(3-phenyl-4-hydroxyphenyl)propane; 2,2-bis(4-hydroxy-3-methylphenyl)propane; 2,2-bis(4-hydroxy-3-ethylphenyl)propane; 2,2-bis(4-hydroxy-3-isopropylphenyl)propane; 2,2-bis(4-hydroxy-3,5-dimethylphenyl)propane; 3,5,3',5'-tetrachloro-4,4'-dihydroxyphenyl)propane; bis(4-hydroxyphenyl)cyclohexylmethane; 2,2-bis(4-hydroxyphenyl)-1-phenylpropane; 2,4'-dihydroxyphenyl sulfone; dihydroxy naphthalene, 2,6-dihydroxy naphthalene; hydroquinone; resorcinol; C_{1-3} alkyl-substituted resorcinols; 2,2-bis-(4-hydroxyphenyl)butane; 2,2-bis-(4-hydroxyphenyl)-2-methylbutane; 1,1-bis-(4-hydroxyphenyl)cyclohexane; bis-(4-hydroxyphenyl); bis-(4-hydroxyphenyl)sulphide; 2-(3-methyl-4-hydroxyphenyl-2-(4-hydroxyphenyl)propane; 2-(3,5-dimethyl-4-hydroxyphenyl)-2-(4-hydroxyphenyl)propane; 2-(3-methyl-4-hydroxyphenyl)-2-(3,5-dimethyl-4-hydroxyphenyl)propane; bis-(3,5-dimethylphenyl-4-hydroxyphenyl)methane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)ethane; 2,2-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)propane; 2,4-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)-2-methylbutane; 3,3-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)pentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclopentane; 1,1-bis-(3,5-dimethylphenyl-4-hydroxyphenyl)cyclohexane; bis-(3,5-dimethylphenyl-4-hydroxyphenyl)sulphide, 3-(4-hydroxyphenyl)-1,1,3-trimethylindan-5-ol, 1-(4-hydroxyphenyl)-1,3,3-trimethylindan-5-ol, 2,2,2',2'-tetrahydro-3,3,3',3'-tetramethyl-1,1'-spirobi[1H-indene]-6,6'-diol, and mixtures thereof.

[c52] 52. The copolyetherimide according to claim 44 wherein R^2 is derived from at least one dihydroxy-substituted aromatic hydrocarbon selected from the group consisting of those of the formula (IX):

(IX) 

,

where independently each R^5 is hydrogen, chlorine, bromine or a C_{1-30} monovalent hydrocarbon or hydrocarbonoxy group, each Z^1 is hydrogen, chlorine or bromine, subject to the provision that at least one Z^1 is chlorine or bromine; and those of the formula (X):

(X) 

,

where independently each R^5 is as defined hereinbefore, and independently R^g and R^h are hydrogen or a C_{1-30} hydrocarbon group.

[c53] 53. The copolyetherimide according to claim 52 wherein R^2 is derived from bisphenol A.

[c54] 54. The copolyetherimide according to claim 44 which has a heat distortion temperature at 0.455 mPa of at least 205°C.

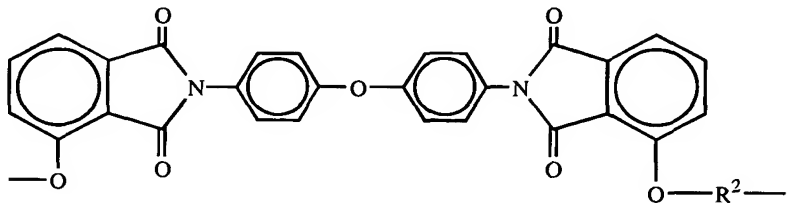
[c55] 55. The copolyetherimide according to claim 44 which has a heat distortion temperature at 0.455 mPa of at least 210°C.

[c56] 56. The copolyetherimide according to claim 44 which has a temperature of transition between the brittle and ductile states of at most 30°C as measured by ASTM method D3763.

[c57] 57. The copolyetherimide according to claim 44 which has a weight average molecular weight, as determined by gel permeation chromatography relative to polystyrene standards, in the range of between about 30,000 and about 80,000.

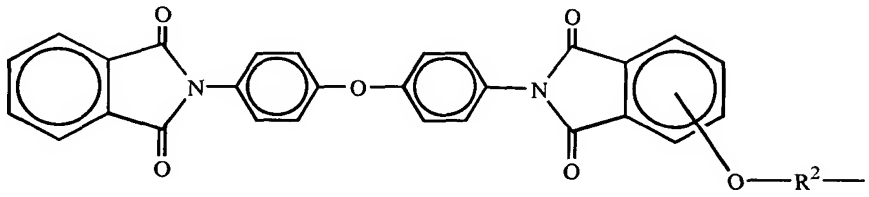
[c58] 58. A copolyetherimide having a glass transition temperature of at least 218°C, said copolyetherimide comprising structural units of the formula (XXIV):

(XXIV)



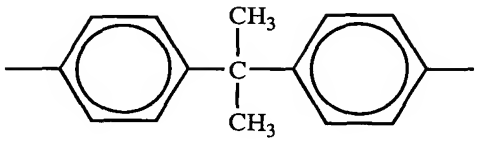
and structural units selected from the group consisting of those of the formula (XXVI):

(XXVI)



wherein the unassigned positional isomer about the phthalimide ring is either in the 3-position or 4-position, and mixtures thereof,

and wherein R^2 is



and wherein the copolyetherimide has a weight average molecular weight, as determined by gel permeation chromatography relative to polystyrene standards, in the range of between about 30,000 and about 80,000, with a polydispersity in a range of between about 2.4 and about 2.8.

[c59] 59. The copolyetherimide of claim 58 having a viscosity value less than or approximately equal to the viscosity of a polyetherimide of comparable molecular weight derived from bisphenol A disodium salt and 4:96 ratio of m-bis(3-chloro-N-phthalimido)benzene and m-bis(4-chloro-N-phthalimido)benzene, said viscosity determined at 380°C and 1000 s^{-1}.

[c60] 60. An article comprising the copolyetherimide of claim 1.

[c61] 61. The article of claim 60 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c62] 62. An article comprising the copolyetherimide of claim 19.

[c63] 63. The article of claim 62 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants; blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c64] 64. An article comprising the copolyetherimide of claim 22.

[c65] 65. The article of claim 64 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c66] 66. An article comprising the copolyetherimide of claim 25.

[c67] 67. The article of claim 66 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c68] 68. An article comprising the copolyetherimide of claim 41.

[c69] 69. The article of claim 68 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers,

antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c70] 70. An article comprising the copolyetherimide of claim 44.

[c71] 71. The article of claim 70 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.

[c72] 72. An article comprising the copolyetherimide of claim 58.

[c73] 73. The article of claim 72 further comprising at least one additive selected from the group consisting of antioxidants, flame retardants, drip retardants, UV blockers, nucleating agents, dyes, pigments, colorants, blowing agents, reinforcing agents, fillers, particulate fillers, reinforcing fillers, glass fibers, E-glass, A-glass, C-glass, ECR-glass, R-glass, S-glass, D-glass, NE-glass, quartz, carbon fibers, carbon microfibers, potassium titanate fibers, gypsum fibers, aluminum oxide fibers, aluminum silicate fibers, magnesium oxide fibers, conductive fillers, glass beads, hollow glass beads, chalks, micas, talcs, natural kaolins, calcined kaolins, stabilizers, antistatic agents, processing aids, plasticizers, mold release agents, lubricants and mixtures thereof.